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10/654,168	09/03/2003	William F. DiVergilio	02-IMP-035	4303

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EXAMINER

ALEMU, EPHREM

ART UNIT PAPER NUMBER

2821

DATE MAILED: 03/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H.A.

## Office Action Summary

Application No.

10/654,168

Applicant(s)

DIVERGILIO ET AL.

Examiner

Ephrem Alemu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 March 2004.  
2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☒ Claim(s) 15-23 is/are allowed.  
6) ☒ Claim(s) 1-14 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 03 September 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 9/03, 12/03 & 3/04.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The information disclosure statement filed on 12/15/03 and 3/22/04 have been placed in the application file, but the information referred to therein has not been considered as to the merits because the information referred to therein are not related to the invention. If applicant still wants the examiner to consider the information referred therein, examiner kindly request applicant to provide a brief description about the relevance of the cited references with respect to the invention.

### ***Drawings***

2. The drawings are objected to because the electrode pair 708,710 shows as either biased positive by the positive power supply 702 or biased to ground instead of showing 708,710 as either biased negative by the negative power supply (702) or biased to ground as described in page 9, lines 25-29. The amended drawing for Fig. 7 should also reflect the power supply 702 being a negative power supply. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after

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the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### *Specification*

3. The abstract of the disclosure is objected to because the abstract contains phrases which can be implied, such as, "The present invention" and refers to purported merits or speculative applications of the invention and compares the invention with the prior art. . Correction is required. See MPEP § 608.01(b).

Applicant is reminded of the proper content, language and format for an abstract of the disclosure.

**The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.**

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. **It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.**

4. The disclosure is objected to because of the following informalities: In page 7, lines 17 and 23, replace "404" with --304--; see Fig. 3. Appropriate correction is required.

5. The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### *Claim Rejections - 35 USC § 102*

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6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-8 and 12-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Wuerker et al. (3,147,445).

Re claim 1, Wuerker discloses a linear acceleration system (i.e., electron beam vacuum tube 20) comprising:

one or more accelerating stages (i.e., accelerating and focusing stage 22, 23) along an axis (i.e., longitudinal axis 27) of the system (Fig. 1; line Col. 5, line 66- Col. 6, line 6); and

a first unipolar electrostatic quadrupole lens (i.e., first section (a) of the quadrupole system) in series with the one or more accelerating stages (i.e., accelerating and focusing stage 22, 23) that focuses an ion beam (35) in a direction transverse to the axis (Figs. 1, 2; Col. 1, line 65- Col. 2, line 41; Col. 6, lines 10-45).

Re claim 2, Wuerker discloses the first unipolar electrostatic quadrupole lens comprises four generally equally spaced electrodes (30-31, 32-33) that generate electrostatic fields transverse to the axis (Fig. 2; Col. 6, lines 33-67).

Re claims 3-7, Wuerker further shows the first pair of electrodes (i.e., electrodes 32a, 33a) which are located opposite each other and the second pair of electrodes (i.e., electrodes 30a, 31a) which are located opposite each other being selectably biased to one of a ground and a first potential (i.e., Vdc being positive or negative) (Figs. 1, 2; Col. 3, lines 13-16; Col. 6, lines 18-66; Col. 9, lines 12-43).

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Re claim 8, Wuerker further discloses a second unipolar electrostatic quadrupole lens (i.e., second section (b) of the quadrupole system) in series with the first unipolar electrostatic quadrupole lens (i.e., first section (a) of the quadrupole system), wherein the first lens focuses in a first direction and the second lens focuses in a second direction that is generally perpendicular to the first direction (Figs. 1, 2; Col. 6, lines 18-66; Col. 18, line 12- Col. 19, line 54).

Re claims 12-14, Wuerker discloses a linear acceleration system (i.e., electron beam vacuum tube 20) including an electrostatic quadrupole lens comprising:

a first pair of electrodes (i.e., electrodes 32a, 33a) located opposite each other, connected to a low resistance path to ground (Figs. 1, 2; Col. 3, lines 13-16; Col. 6, lines 18-66; Col. 9, lines 12-43);

a second pair of electrodes (i.e., electrodes 30a, 31a) located opposite each other, wherein the first pair of electrodes (i.e., electrodes 32a, 33a) and the second pair of electrodes (i.e., electrodes 30a, 31a) are equally spaced about a center point, the second pair of electrodes biased to a first potential (i.e.,  $V_{dc}$  being positive or negative) (i.e., positive or negative) (Figs. 1, 2; Col. 3, lines 13-16; Col. 6, lines 18-66; Col. 9, lines 12-43; wherein the first potential being positive or negative).

### ***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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9. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wuerker et al. (3,147,445) in view of Swenson et al. (US 5,430,359).

Re claim 9-10, Wuerker does not mention beam that travels along the axis and is shaped by the first unipolar electrostatic quadrupole lens without a substantial loss of beam current being low energy ion beam the is at an energy level of less than about 20 Kev (90 Kev).

However, it is known radio frequency quadrupole (RFQ) accelerators have been used to accelerate ions and other charges from few tens of kilo electron volts to energies of a few of million electron volts (Col. 1, lines 21-36).

Therefore, it would have been obvious at the time the invention was made for the ion beam that travels along the axis of Wuerker's linear acceleration system (i.e., electron beam vacuum tube 20) being low energy ion beam, that is at an energy level of less than about 20 Kev (90 Kev) for no other reason than accelerating the low energy ions to much higher energies as taught by Swenson.

***Allowable Subject Matter***

10. Claims 15-23 are allowed.

11. The following is an examiner's statement of reasons for allowance: The prior art of record fail to teach or suggest alone or in combination, the limitations: "a switching circuit controllably connected to ground and a first voltage potential; a first pair of electrodes located opposite each other, connected to the switching circuit; wherein the first pair of electrodes and the second pair of electrodes are equally spaced about a center point, the second pair of electrodes biased to a second voltage potential" as claimed in claim 15; and "determining whether a desired ion beam energy is greater than a first threshold; and configuring a quadrupole

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lens along a beam path of the ion beam in one of a bipolar configuration or a unipolar configuration based on the determination” as claimed in claim 19. It is for these reasons in combination with all the other limitations in the independent claims 15 and 19, that claims 15-18 and claims 19-23 are allowable over prior art of record.

### ***Conclusion***

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Anderson (US 4,912,421); Glavish et al. (US 4,667,111); Maschke (US 4,560,905) and Glaser (US 2,919,381); also teach similar inventive subject matter.

### ***Correspondence***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ephrem Alemu whose telephone number is (571) 272-1818. The examiner can normally be reached on M-F Flex hours.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Don K Wong can be reached on (571) 272-1834. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

EA  
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**TUYET VO**  
**PRIMARY EXAMINER**